SPECIAL AIRWORTHINESS INFORMATION BULLETIN

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This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin alerts owners and operators of **Eurocopter France AS350B, BA, B1, B2, B3, D, AS355E, and EC120B model helicopters**, that the pilot can encounter a phenomenon known as *Servo Transparency, Servo Reversibility, or Jack Stall*. To clarify this concept, we will refer to the phenomenon as **Servo Transparency**.

Reference: Eurocopter Service Letters	
1) For Astar family	#1648-29-03
2) For Colibri family (EC120B)	#1649-29-03

Background

Pilots and operators may misunderstand this phenomenon. This aircraft phenomenon occurs smoothly, and can be managed properly if the pilot anticipates it during an abrupt or high load maneuver such as a high positive g-turn or pull-up. The factors that affect Servo Transparency are high airspeed, high collective pitch, high gross weight, high "G"-loads, and high-density altitude.

The maximum force that the servo actuators can produce is constant and is a function of hydraulic pressure and of the servo characteristics. The system is designed to exceed the requirements of the flight limitations in the approved flight manual. With excessive maneuvering and under a combination of the above listed factors, the aerodynamic forces can increase beyond the opposing hydraulic servo forces and Servo Transparency can occur. An improperly serviced/maintained hydraulic system can also effect the onset of Servo Transparency.

Servo Transparency begins when the aerodynamic forces exceed the hydraulic forces and is then transmitted back to the pilot's cyclic and collective controls. On **clockwise turning main rotor systems**, the right servo receives the highest load when maneuvering, so Servo Transparency results in uncommanded right and aft cyclic motion accompanied by down collective movement. The pilot control force to counter this aerodynamically-induced phenomena are relatively high and *could give* an unaware pilot the impression that the controls are jammed. If the pilot does not reduce the maneuver, the aircraft will roll right and pitch-up.

The amplitude of the induced control feedback loads is proportional to the severity of the maneuver, but the phenomenon normally lasts less than 2 seconds.

Recommendations

- You should review Chapter 14, Aeronautical Decision Making, Rotorcraft Flying Handbook FAA-H-8083-21.

- You should properly service the Hydraulic system before each flight.

- The pilot should follow *(not fight)* the control movement. Allow the collective pitch to decrease (monitoring Rotor RPM, especially at very low collective pitch settings) to reduce the overall load. You should be aware that as the load is reduced, hydraulic assistance will be restored and force being applied to the controls could result in undesired opposite control movement. Follow the aircraft limitations in accordance with the Aircraft Flight Manual.

- You should understand that ***Servo Transparency is a natural phenomenon*** for any flyable helicopter. **BASIC AIRMANSHIP** should prevent encountering this phenomenon by avoiding combinations of high speed, high gross weight, high-density altitude, and aggressive maneuvers, which exceed the aircraft's approved flight limitations.

For Further Information Contact

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